



(19)

Europäisches Patentamt

European Patent Office

Office européen des brevets



(11)

**EP 0 382 716 B2**

(12)

**NEW EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention  
of the opposition decision:  
28.01.1998 Bulletin 1998/05

(45) Mention of the grant of the patent:  
12.01.1994 Bulletin 1994/02

(21) Application number: 88903109.2

(22) Date of filing: 18.03.1988

(51) Int. Cl.<sup>6</sup>: **A61K 47/00**

(86) International application number:  
PCT/US88/00886

(87) International publication number:  
WO 88/07871 (20.10.1988 Gazette 1988/23)

**(54) USE OF COMMERCIAL LECITHIN AS SKIN PENETRATION ENHANCER**

VERWENDUNG VON HANDELSÜBLICHEM LEZITHIN ALS HAUTPENETRATIONSFÖRDERER  
UTILISATION DE LECITHINE COMMERCIALE EN TANT QU'AGENT AMELIORANT LA  
PENETRATION AU TRAVERS DE LA PEAU

(84) Designated Contracting States:  
AT BE CH DE FR GB IT LI LU NL SE

(30) Priority: 13.04.1987 US 37671

(43) Date of publication of application:  
22.08.1990 Bulletin 1990/34

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- Chemical Abstracts, vol. 106, no. 14, 6 April 1987 (Columbus, Ohio, US), see p. 373, abstract no. 107916n
- Patent Abstracts of Japan, vol. 8, no. 150, (C-233)(1587), 12 July 1984
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**Description**

Lecithin, as used in commerce, is the name given to a group of substances present in fats which are obtained mainly from oil seeds, for example, soybeans and rape seeds) and from egg yolks. Commercial lecithin is a natural emulsifying agent used in foodstuffs and pharmaceutical products, for example, in creams, balms, or ointments.

Lecithin has also been described in dispersions or suspensions in propellants. For example, bronchodilators can be administered by inhalation means in a propellant containing lecithin.

It has now been found that lecithin enhances the penetration of a drug through the skin and across other biological membranes, such as intestinal, buccal, rectal, and nasal. Thus an object of the present invention is a method of administering a drug transdermally or transmucosally by using lecithin in the pharmaceutical composition.

Accordingly, the present invention relates to a pharmaceutical composition adapted for transdermal or transmucosal administration comprising an active ingredient and an effective amount of lecithin.

Transdermal pharmaceutical compositions are used as a means for avoiding the uncertainties of oral administration and the inconvenience of administration by injection.

An active ingredient for purposes of the present invention is an effective amount of any therapeutically active drug.

Preferred drugs are those which find application in various therapeutic uses such as antihypertensives, analgesics, antitussives, antihistamines, bronchodilators and cognition activators. Therefore, the lecithin compositions are expected to be useful in drugs such as procaterol, dextromethorphan, oxymorphone and diphenhydramine.

The lecithin employed by the present invention is commercial lecithin or soy lecithin, for example, Lucas Meyer, Inc. commercial soy lecithins such as Epikuron™ 135F and Capcithin™ 50-R. The amount of lecithin used in the transdermal formulations may vary depending on the amount of active ingredient needed and the use of other excipients. A useful range of lecithin found to be effective for penetration enhancement is about 2 to about 40% by weight of the composition. Preferred is from about 5 to about 10%.

The present composition also may contain pharmaceutically acceptable excipients. These are, for example, tetraglycol (TG), alcohols, glycols, fatty acids, triacetin and silicon fluids.

The following examples in table form are illustrative of the present invention where the use of commercial soy lecithin was found to enhance penetration of various drugs through mouse skin.

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TABLE

Formulation Number	Composition	Percent w/w	Drug Category	Flux ( $\mu\text{g}/\text{cm}^2/\text{h}$ )	Flux Value in Absence of Lecithin ( $\mu\text{g}/\text{cm}^2/\text{h}$ )
1.	Procaterol	2	Bronchodilator	93	Negligible
	EP 135 F	10			
	TG	88			
2.	CI-969*	2	Cognition Activator	110	5
	EP 135 F	10			
	TG	88			
3.	Dextromethorphan	2	Antitussive	214	10
	EP 135 F	10			
	TG	88			
4.	Dextromethorphan	2	Antitussive	119	10
	Cap 50-R	10			
	TG	88			
5.	Oxymorphone	4	Analgesic	25	Negligible
	EP 135 F	10			
	TG	86			
6.	Diphenhydramine	10	Antihistamine	570	~100
	EP 135 F	20			
	TG	70			
7.	Diphenhydramine	10	Antihistamine	1100	~100
	EP 135 F	10			
	TG	80			
8.	Diphenhydramine	10	Antihistamine	490	~100
	Cap 50-R	10			
	TG	80			

**Code:**  
EP 135 F = Epikuron™ 135F (Lucas Meyer, Inc.)  
TG = Tetraglycol  
Cap 50-R = Capcithin™ 50R (Lucas Meyer, Inc.)

\* CI-969 = Ethanone,1-(1,2,5,6-tetrahydro-1-methyl-3-pyridinyl)-0-acetyloxime.

### Claims

- Use of a commercial soy bean lecithin for the manufacture of pharmaceutical compositions enhancing penetration of a drug through the skin or other biological membrane, wherein the pharmaceutical compositions contain a therapeutically effective amount of an active ingredient, an effective amount of commercial soy bean lecithin and one or more pharmaceutically acceptable excipients with the proviso that the pharmaceutical composition is in a non-liposome form.
- Use according to claim 1, wherein the active ingredient is an antihypertensive.

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3. Use according to claim 1, wherein the active ingredient is an antihistamine.
4. Use according to claim 1, wherein the active ingredient is an analgesic.
- 5 5. Use according to claim 1, wherein the active ingredient is an antitussive.
6. Use according to claim 1, wherein the active ingredient is a cognition activator.
7. Use according to claim 1, wherein the active ingredient is a bronchodilator.
- 10 8. Use according to claim 1, wherein the active ingredient is procaterol.
9. Use according to claim 1, wherein the active ingredient is diphenhydramine.
- 15 10. Use according to claim 1, wherein the active ingredient is dextromethorphan.
11. Use according to claim 1, wherein the active ingredient is oxymorphone.
12. Use according to claim 1, wherein the effective amount of lecithin is 2 to 40 %.
- 20 13. Use according to claim 1, wherein the effective amount of lecithin is 5 to 10 %.

### Patentansprüche

- 25 1. Verwendung von handelsüblichem Sojabohnenlecithin zur Herstellung von Arzneimittelzubereitungen erhöhter Arzneimitteldurchdringung durch die Haut oder eine sonstige biologische Membran, wobei die Arzneimittelzubereitungen eine therapeutisch wirksame Menge eines aktiven Bestandteils, eine wirksame Menge handelsüblichen Sojabohnenlecithins und einen oder mehrere pharmazeutisch akzeptablen (akzeptable) Streckmittel enthält unter dem Proviso, daß die Arzneimittelzubereitung in einer nicht liposomen Form vorliegt.
- 30 2. Verwendung nach Anspruch 1, wobei der aktive Bestandteil aus einem blutdrucksenkenden Mittel besteht.
3. Verwendung nach Anspruch 1, wobei der aktive Bestandteil aus einem Antihistamin besteht.
- 35 4. Verwendung nach Anspruch 1, wobei der aktive Bestandteil aus einem Analgetikum bzw. Schmerzmittel besteht.
5. Verwendung nach Anspruch 1, wobei der aktive Bestandteil aus einem Antitussivum bzw. Hustenmittel besteht.
6. Verwendung nach Anspruch 1, wobei der aktive Bestandteil aus einem Wahrnehmungsaktivator besteht.
- 40 7. Verwendung nach Anspruch 1, wobei der aktive Bestandteil aus einem Bronchodilatator besteht.
8. Verwendung nach Anspruch 1 wobei der aktive Bestandteil aus Procaterol besteht.
- 45 9. Verwendung nach Anspruch 1, wobei der aktive Bestandteil aus Diphenhydramin besteht.
10. Verwendung nach Anspruch 1, wobei der aktive Bestandteil aus Dextromethorphan besteht.
11. Verwendung nach Anspruch 1, wobei der aktive Bestandteil aus Oxymorphone besteht.
- 50 12. Verwendung nach Anspruch 1, wobei die wirksame Lecithinmenge 2 - 40% beträgt.
13. Verwendung nach Anspruch 1, wobei die wirksame Lecithinmenge 5 - 10% beträgt.

### 55 Revendications

1. L'utilisation de la lécithine de soja disponible dans le commerce pour la préparation de composition pharmaceutique améliorant la pénétration d'un médicament au travers de la peau ou au travers d'autres membranes biologi-

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ques, caractérisée en ce que les compositions pharmaceutiques contiennent une quantité efficace du point de vue thérapeutique d'un principe actif, une quantité efficace de lécithine de soja disponible dans le commerce et un ou plusieurs excipients pharmaceutiquement acceptables sous la réserve, que les compositions pharmaceutiques ne contiennent pas une formulation à base de liposome.

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2. L'utilisation selon la revendication 1, caractérisée en ce que le principe actif est un anti-hypertenseur.

3. L'utilisation selon la revendication 1, caractérisée en ce que le principe actif est un anti-histaminique.

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4. L'utilisation selon la revendication 1, caractérisée en ce que le principe actif est un analgésique.

5. L'utilisation selon la revendication 1, caractérisée en ce que le principe actif est antitussif.

6. L'utilisation selon la revendication 1, caractérisée en ce que le principe actif est un activateur de cognition.

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7. L'utilisation selon la revendication 1, caractérisée en ce que le principe actif est un broncho-dilatateur.

8. L'utilisation selon la revendication 1, caractérisée en ce que le principe actif est le procatérol.

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9. L'utilisation selon la revendication 1, caractérisée en ce que le principe actif est la diphenhydramine

10. L'utilisation selon la revendication 1, caractérisée en ce que le principe actif est le dextrométhorphan.

11. L'utilisation selon la revendication 1, caractérisée en ce que le principe actif est l'oxymorphone.

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12. L'utilisation selon la revendication 1, caractérisée en ce que la quantité efficace de lécithine est comprise entre 2 et 40%.

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13. L'utilisation selon la revendication 1, caractérisée en ce que la quantité efficace de lécithine est comprise entre 5 et 10%.

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